Pyramid Way and McCarran Boulevard Intersection Improvement Project

ENVIRONMENTAL IMPACT STATEMENT

RTC Project No. 73299
Federal Project No. CM-0191-(063)

AIR QUALITY ASSESSMENT

Regional Transportation Commission of Washoe County,
Federal Highway Administration,
and
Nevada Department of Transportation

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Acronyms

ADT	average daily traffic
AQMD	Washoe County Health District - Air Quality Management Division
BMPs	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CFR	*Code of Federal Regulations*
CO	carbon monoxide
EPA	United States Environmental Protection Agency
°F	degrees Fahrenheit
FHWA	Federal Highway Administration
HA87	Hydrographic Area 87
LOS	level of service
$\mu g/m^3$	micrograms per cubic meter
mph	miles per hour
MPO	metropolitan planning organization
NAAQS	National Ambient Air Quality Standards
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_X	nitrogen oxide
O_3	ozone
Pb	lead
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
RTC	Regional Transportation Commission of Washoe County
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	state route
TCM	transportation control measure
USDOT	United States Department of Transportation
VOC	volatile organic compounds
WC-AQMD	Washoe County Health District - Air Quality Management Division

EXECUTIVE SUMMARY

This study provides assessment of the potential impacts to local air quality from implementation of the proposed Pyramid Way (SR 445) and McCarran Boulevard (SR 659) Intersection Improvements project. The proposed project is located in Sparks, Nevada. It includes the intersection of Pyramid Way and McCarran Boulevard and extends on Pyramid Way from just north of Queens Way to York Way as the southern boundary, and on McCarran Boulevard from Rock Boulevard on the west to Fourth Street. The findings of the air quality analysis are as follows:

- Local carbon monoxide (CO) concentrations under future "Build" conditions would not exceed the national ambient air quality standards and no CO hot spots are anticipated to occur.

- The proposed project would not increase particulate matter (PM_{10} and/or $PM_{2.5}$) concentrations since it is not expected to introduce a significant number of diesel trucks. t and would not generate PM hot spots.

- Operation or construction of the proposed project would not expose receptors to significant emissions of hazardous air pollutants (including mobile source air toxics [MSATs]), and would not have adverse health effect to sensitive receptors.

- Project development could result in a temporary short-term increase of daily emissions of CO and PM_{10}, during various stages of construction activities without incorporation of mitigation measures. However, complying with the WC-AQMD permit requirements, which includes application of best management practices, would effectively limit the daily emissions of PM_{10} during construction phase of the project. Construction of the proposed project would not create adverse effects and the project would comply with the WC-AQMD requirements.

- The proposed project area is located in the Truckee Meadows (HA87) in Washoe County, is currently designated as a nonattainment area for PM_{10} and a maintenance area for CO. Areas designated as nonattainment are required to develop attainment/ maintenance plans, and a State Implementation Plan (SIP) to meet state and federal goals for air quality. The FY 2008-2030 Regional Transportation Plan (RTP) and the FY 200-2013 Regional Transportation Improvement Program (RTIP), prepared by the Regional Transportation Commission of Washoe County (RTC), rely on the emission budgets established by the SIP or attainment plans. Therefore, projects that are listed in the current transportation plans (i.e., RTP and RTIP) are considered consistent with the SIP; and meet CAA conformity requirements. The proposed project is listed in the final federally approved FY 2008-2030 RTP and FY 2009-2013 RTIP; therefore, the project is considered to meet the CAA requirements and is in conformity with the SIP.

- Construction of the proposed project Build alternative would occur in one phase and would be completed in 18 months. Temporary construction-related dust and equipment exhaust emissions would occur during site preparation and project construction. Compliance with the Washoe County AQMD rules and permit requirements, which includes application of best management practices, would effectively limit the daily emissions of pollutants during construction period. Therefore, construction of the proposed project would not create adverse effects.

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this study is to evaluate the potential air quality impacts of the proposed McCarran Boulevard and Pyramid Way Intersection Improvements Project. The proposed project is located in Sparks, Nevada. The project corridor includes the intersection of Pyramid Way and McCarran Boulevard and extends on Pyramid Way from just north of Queens Way to York Way as the southern boundary, and on McCarran Boulevard from Rock Boulevard on the west to Fourth Street. Potential air quality impacts are analyzed for construction and operation of the proposed project.

1.2 Project Description

The Regional Transportation Commission of Washoe County (RTC), in cooperation with the Nevada Department of Transportation (NDOT) and the Federal Highway Administration (FHWA), is studying operational improvements to the intersection of North McCarran Boulevard (State Route 659) and Pyramid Way (State Route 445) in Sparks, Washoe County, Nevada.

McCarran Boulevard and Pyramid Way are currently two lanes in each direction. The proposed improvements would widen Pyramid Way to three lanes in each direction from Queen Way to Tyler Way. McCarran Boulevard would remain two lanes in each direction. Operational improvements at the intersection consist of additional turning lanes: eastbound McCarran Boulevard to northbound Pyramid Way; westbound McCarran Boulevard to southbound Pyramid Way; westbound McCarran Boulevard to northbound Pyramid Way; northbound Pyramid Way to westbound McCarran Boulevard; and southbound Pyramid Way to westbound McCarran Boulevard. The Pyramid Way and Queen Way intersection would also be reconfigured to provide access to the surrounding neighborhoods. Widening of Pyramid Way and McCarran Boulevard would occur on the east and south sides, respectively, to accommodate these improvements.

Figure 1-1 Project Regional Location

Figure 1-2 Project Corridor Vicinity Map

2.0 REGULATORY FRAMEWORK

The proposed project site and vicinity are subject to air quality regulations developed and implemented at the federal, state, and local levels. The local air quality management authority in the project area is the Washoe County District Health District, Air Quality Management Division (WC-AQMD or AQMD).

2.1 Federal Regulations/Standards

2.1.1 Clean Air Act

Pursuant to the passage of the federal Clean Air Act (CAA) of 1970, EPA established National Ambient Air Quality Standards (NAAQS). The NAAQS were established for several major pollutants, termed "criteria pollutants". The NAAQS are two-tiered: primary standards to protect public health and secondary standards to prevent environmental degradation.

The CAA establishes federal air quality standards, known as NAAQS, and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement the State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. The 1990 amendments to the CAA identify specific emission-reduction goals. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones.

Table 2-1. National Ambient Air Quality Standards and Washoe County Attainment Status

Pollutant	Averaging Period	Standards		Attainment Status (Washoe County)
		Primary	Secondary	
Ozone (O_3)	8-hour	0.075 ppm	Same as primary	Unclassifiable/ Attainment
Particulate Matter (PM_{10}) [a]	24-hour	150 μg/m^3	Same as primary	Serious Nonattainment [a]
Particulate Matter ($PM_{2.5}$)	24-hour	35 μg/m^3	Same as primary	Attainment
	Annual (AAM)	15 μg/m^3	Same as primary	Attainment
Carbon Monoxide (CO)	1 hour	35 ppm	None	Attainment/ Maintenance [a]
	8 hour	9 ppm		
Nitrogen Dioxide (NO_2)	Annual (AAM)	53 ppb	Same as primary	Attainment
	1-hour	100 ppb	-	n/a [b]
Sulfur Dioxide (SO_2)	Annual (AAM) [c]	0.03 ppm	-	Attainment
	24-hour [c]	0.14 ppm	-	Attainment

Table 2-1. National Ambient Air Quality Standards and Washoe County Attainment Status

Pollutant	Averaging Period	Standards		Attainment Status (Washoe County)
		Primary	Secondary	
	3-hour	-	0.5 ppm	-
	1-hour	75 ppb	-	n/a [b]
Lead (Pb)	Rollin 3-month average	0.15 μg/m^3	Same as primary	Attainment
	Calendar Quarter	1.5 μg/m^3	Same as primary	Attainment

Notes:
ppm = parts per million; ppb = parts per billion; μg/m^3 = micrograms per cubic meter; n/a = not available

[a] *The Truckee Meadows area (HA 87) is serious nonattainment for 24-hour PM_{10}, and maintenance for CO; the rest of the County is in attainment with theses standards.*

[b] *Final rule for the standard was signed on June 2, 2010. The appropriate recorded ambient data and area designation are not yet available. To attain this standard, the 3-year average of the 98th percentile (for NO_2) and 99th percentile (for SO_2) of the daily maximum 1-hour average concentrations of pollutant at each monitor within an area must not exceed 100 ppb and 75 ppb for NO_2 and SO_2, respectively.*

[c] *EPA revoked both, annual and 24-hour SO_2 standards, effective August 23, 2010.*

Source: EPA, 2012.

Attainment Status

The CAA requires areas of the country to be designated as either attainment or non-attainment for each of the criteria pollutants, based on whether compliance with the NAAQS has been achieved. According to EPA, the entire state of Nevada is in attainment/unclassifiable status for $PM_{2.5}$ *(EPA, 2011).* Washoe County attainment status is included in Table 1. Within Washoe County, the Truckee Meadows area, defined as Hydrographic Area 87 (HA 87), is designated as a serious non-attainment area for PM_{10}. In July 2009, a revision to the PM_{10} State Implementation Plan (SIP) was submitted to EPA Region IX requesting redesignation of HA 87 to Attainment/Maintenance for the 24-hour PM_{10} NAAQS. On April 19, 2011, EPA published a final rule (76 FR 21807) finding that the: 1) Truckee Meadows failed to attain the NAAQS by the applicable date; and 2) the Truckee Meadows is currently attaining the NAAQS based on recent monitoring data (2007-2009). The rule does not change the "Serious" nonattainment designation. Washoe County is in attainment for all other AAQS.

2.1.2 Transportation Conformity Rule

EPA, in conjunction with the United States Department of Transportation (DOT), established the Transportation Conformity Rule, as defined in 40 CFR Parts 51 and 93, on November 30, 1993. The rule implements the Federal CAA conformity provisions. The CAAA require that transportation plans, programs, and projects that are funded by or approved under Title 23 United States Code (U.S.C.) or the Federal Transit Act, conform to state or federal air quality plans for achieving NAAQS. "Conformity" is defined under section 176(c) of the CAA as conforming to the purpose of the SIP to ensure that

transportation plans, programs, and projects do not: 1) produce new air quality violations, 2) worsen existing violations, or 3) delay timely attainment of NAAQS. According to the CAA, federally supported activities must conform to the implementation plan's purpose of attaining and maintaining these standards.

In March 2006, EPA amended the Transportation Conformity Rule to address localized impacts of particulate matter (71 FR 12468). EPA and FHWA developed a guidance document: *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA and FHWA, 2006)

Regional conformity for a given project is analyzed by discussing if the proposed project is included in a conforming Regional Transportation Plan or Transportation Improvement Plan with substantially the same design concept and scope that was used for the regional conformity analysis. Project level conformity is analyzed by discussing if the proposed project would cause localized exceedances of CO, PM_{10}, and/or $PM_{2.5}$ standards, or of it would interfere with "timely implementation" of Transportation Control Measures called out in the State Implementation Plan.

3. AFFECTED ENVIRONMENT

3.1 Regional Setting

The proposed project is located in the southern portion of Washoe County in Nevada. Washoe County covers a total area of 6,551 square miles in the northwest of the state of Nevada and borders California to the west and Oregon to the north. The majority of Washoe County's population is concentrated in the southern portion of the county, especially in the Truckee Meadows. The Truckee Meadows is approximately 200 square miles in size and identified as Hydrographic Area 87 (HA 87) as defined by the State of Nevada Division of Water Resources.

3.2 Climate and Meteorology

The climate of the project region is mild, with low humidity and rainfall and it generally has a full range of four seasons, with short summers. Temperatures range from an average daily maximum of approximately 76 degrees Fahrenheit (ºF) in July, to an average daily minimum of approximately 35 ºF in January.

Nevada lies on the eastern, lee side of the Sierra Nevada Range, a mountain barrier that markedly influences the climate of the State. One of the greatest contrasts in precipitation found within a short distance in the United States occurs between the western slopes of the Sierras in California and the valleys just to the east of this range. The prevailing winds are from the west and, as the warm moist air from the Pacific Ocean ascends the western slopes of the Sierra Range, the air cools, condensation takes place and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. Annual precipitation at the Reno Airport Meteorological Station averaged 7.29 inches over a period of 63 years from 1937 to 2010. Snowfall, as recorded in the Reno Airport Station averaged 23 inches per year over the same period (1937 to 2010).

Surface meteorology in the western Nevada is generally characterized by prevailing westerly winds, with monthly average wind speeds ranging from 4.4 to 8.2 miles per hour (mph).

4.0 METHODOLOGY

This air quality analysis is based on the methodology and assumptions which are consistent with the requirements of the National Environmental Policy Act (NEPA) and the CAA Amendments of 1990, and the WC-AQMD. The analysis also utilizes guidelines and procedures provided in applicable air quality analysis protocols and guidance documents such as the EPA's *Guidelines for Modeling Carbon Monoxide from Roadway Intersections (EPA, 1992)*, Federal Highway Administration (FHWA) and EPA, *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (Guidelines)* (EPA, 2006c), and the FHWA *Interim Guidance on Air Toxics Analysis in NEPA Documents* (FHWA, 2006) and its update *Interim Guidance Update on Air Toxics Analysis in NEPA Documents* (FHWA, 2009).

Operational Emissions

Vehicular emissions constitute the primary source of air pollutants associated with operation of the proposed project. The direct emissions associated with vehicle traffic were estimated based on the peak and off-peak traffic volumes and vehicle miles traveled (VMT) along the project corridor, using the modeled emission factors from MOBILE6.2.The model inputs were prepared by consulting with the WC-AQMD[1]. The WC-AQMD provided the local parameters for input files including the ambient temperature, fuel characteristics, vehicle fleet mix, and I/M programs.

Localized CO Analysis

The procedures and guidelines provided in the EPA document: *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (CO-Guidelines - EPA, 1992) were followed to determine if a CO hot-spot analysis would be required. Based on the traffic analysis (Parsons, 2012), under the Build Alternative, one intersection is expected to operate at LOS D or worse during peak hour traffic. This intersection was analyzed quantitatively to determine the localized CO impacts. A hot-spot analysis was performed using the EPA CAL3QHC dispersion model (version 2.0, February 21, 1995), in conjunction with the MOBILE6.2 model emission factors. The CO hot-spot analysis is provided in Chapter 5 of this report.

Particulate Matter Hot Spot Analysis

Based on the PM hot-spot analysis requirements of the March 10, 2006, final rule, the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (Guidelines)* [EPA420-B-06-902, March 2006], developed by EPA and FHWA, was used to conduct PM (PM_{10} and $PM_{2.5}$) hot spot analysis for the project-level conformity assessment. It should be noted that the final Guidelines of December 2010: *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* [EPA420-B-10-040], is a complementary document to the March 2006 and includes guidelines for

[1] *Personal communication with Daniel Inouye from WCAQMD, September 2011.*

modeling and quantitative analysis of the projects that need to be further analyzed for localized PM effects. Because the proposed project is not a project of local air quality concern, a qualitative PM analysis was considered.

Furthermore, while projects generate particulate emissions during construction, under the EPA transportation conformity rule, construction activities lasting five years or less are considered temporary impact and are not included in hot-spot analysis. As such, only operational emissions were considered in PM hot-spot analysis for the project Build Alternative.

Mobile Source Air Toxics (MSAT) Emissions

Because evaluation of the project level impact of MSAT for transportation projects is an emerging process, guidance manuals and protocols to assess air quality impacts are currently in the development stage. Therefore, for assessment of project level MSAT emissions the FHWA *Interim Guidance Update on Mobile Source Air Toxics Analysis in environmental documents* (FHWA, 2009) was used. Analysis of potential impacts of MSAT emissions was conducted using this Guidance document to determine which category the proposed project falls into (i.e., no analysis, qualitative analysis, or quantitative analysis), and provided applicable discussion as prescribed in the Guidance document.

Impact Criteria

Project-related emissions would have adverse environmental impact if they result in pollutants emission levels that either create violation of an ambient air quality standard (NAAQS identified in Table 2-1) or contribute to an existing air quality violation.

5.0 IMPACT ANALYSIS AND MITIGATION MEASURES

This section addresses the impact of emissions from project construction and operation on regional and local air quality.

5.1 No Build Alternative

The No Build Alternative would not implement the proposed improvements to the Pyramid Way/McCarran Boulevard intersection and the Pyramid Way and other roadways configurations within the project area would remain in the existing physical condition. This alternative would not include construction activities; thus, there would be no impacts associated with construction emissions. Furthermore, no changes in operational emissions would occur under the No Build Alternative; the intersection and roadway capacity for future traffic growth would be inadequate, resulting in slower traffic, more congestion, and increased idling time and higher emissions on a per-mile basis.

5.2 Build Alternative

The proposed Build Alternative would provide traffic flow improvement and congestion relief through the main components of the project, as described in Section 1. The following sections provide analysis of the air quality emissions impacts for construction and operation of the proposed project and comparison of emissions for the Build and No Build scenarios.

5.2.1 Long Term (Operational) Impacts

5.2.1.1 Regional Air Quality Conformity

As described in Section 2, the Transportation Conformity Rule requires a regional emission analysis to be performed by the MPO for projects within its jurisdiction. Both plans must support an affirmative conformity finding to obtain FHWA approval. Projects that are included in the regional analysis are listed in the RTIP and referenced in the RTP, and they are considered to have met the conformity requirement for regional emissions analysis.

The RTC is the MPO for the project region. The most recent approved/adopted transportation plan in the project area is the RTP Fiscal Year (FY) 2008-2030, and the most recent federally approved transportation implementation plan is the FY 2009-2013 RTIP. It should be noted that the FY 2011-2015 RTIP has been approved by the RTC on May 20, 2011 and it is pending federal approval. The RTP outlines the region's long-range transportation plans to accommodate the master-planned development in the City of Reno, City of Sparks and Washoe County. The RTP includes all regionally significant projects regardless of funding source(s) plus all other non-federal projects funded through the RTC. The RTC adopted the plan on November 21, 2008 and it was federally approved on July 21, 2009 *(RTC, 2009a)*. The RTIP is the RTC's five-year program of projects designed to implement short-term street and highway, transit, bicycle and

pedestrian projects for Washoe County. The RTC Board approved the FY 2009-2013 RTIP on November 21, 2008 *(RTC, 2009b)*. The RTIP includes a summary of projects by fiscal year and shows the agency responsible for implementing the project, funding source and other related information. The RTIP represents a prioritized program directed at meeting Washoe County's growing transportation needs while improving the region's air quality, transportation efficiency, safety and mobility.

To be in conformance, a project must be included in the list of projects of the federally approved transportation plans and programs. The proposed project is included in the FY 2008-2030 RTP on page 3-28, and in the project listing of the FY 2009-2013 RTIP, page 5 of Amendment #11, with the description: Geographic Improvements (Pyramid Highway Urban Interchange @ McCarran Blvd). The proposed project is also included in the FY 2011-2015 RTIP Table 7-1. The following allocated fund sources are identified for the proposed project:

Surface Transportation Program (STP) – Local: $28,800k
National Highway System (NHS) – Federal: $6,000k
Congestion Mitigation/Air Quality (CMAQ): $28,000k
Other: $8,200k

As noted above, the FY 2011-2015 RTIP has been approved by the RTC on May 20, 2011 and it is anticipated to be federally approved in a near future.

The design concept and scope of the proposed project is consistent with the project description in the approved RTIP and the assumptions in RTC's regional emissions analysis. As such, the project would not interfere with the timely implementation of all TCMs identified in the currently approved SIP. Because the proposed project is included in the list of projects in the RTIP, the regional emissions contemplated by the Plan would not change due to its implementation. Furthermore, the proposed project would not cause an increase in the County's population, but it would accommodate the predicted future population of the area. Therefore, an additional regional analysis is not required for this project.

5.2.1.2 Local Air Quality

Project Level Conformity

The local impact analysis is commonly referred to as project-level air quality or hot-spot analysis. CO and PM_{10} are the pollutants of major concern along roadways. Therefore, CO and PM_{10} concentrations are usually indicative of the local air quality generated by a roadway network. On-road vehicles can also make significant contributions to $PM_{2.5}$.

Furthermore, according to the EPA transportation conformity rule, a project-level conformity determination is required for projects in CO, PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas. As described in Section 2.2 and summarized in Table 2-1, the project area (Truckee Meadows Air Basin - HA87) is currently designated as maintenance for CO and nonattainment for PM_{10}. Therefore, hot spot analysis is provided

for CO, and PM_{10} to determine if the project would cause any new violations of the NAAQS for these pollutants or would increase the frequency or severity of any existing violation.. The approach to the local analysis is tiered and is dependent on the SIP: the CO analysis can be qualitative or quantitative. The PM_{10} and $PM_{2.5}$ analysis is qualitative in scope. The project area is in attainment for $PM_{2.5}$ emissions *(EPA, 2005)*; therefore, $PM_{2.5}$ analysis was not performed for this technical study.

Localized Carbon Monoxide – CO Hot spot Analysis

According to the guidelines provided in the EPA document: *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (EPA, 1992), CO dispersion modeling is required for critical intersections affected by the proposed project, where the level of service (LOS) is D or worse or those that have changed to LOS D or worse by project implementation. Table 5-1 presents the projected traffic conditions at the affected intersections. As shown, under the Build Alternative, the LOS and delay times would improve considerably compared with the No Build scenario. Furthermore, all affected intersections would operate at LOS C or better, except for one. Intersection of Pyramid Way and McCarran Boulevard would also improve, compared with No-Build condition. This intersection would improve from LOS F during both AM and PM traffic peak periods to LOS D and E during AM and PM peak hours, respectively. For this intersection local CO concentrations were estimated using the EPA CAL3QHC dispersion model.

Table 5-1. Peak Hour Traffic Condition at Affected Intersections
Existing Scenario and Horizon Year

Intersection	Peak Hour	Existing, Year 2010		Traffic Condition for 2030			
				No Build		Build	
		LOS	Delay/Vehicle (sec)	LOS	Delay/Vehicle (sec)	LOS	Delay/Vehicle (sec)
McCarran Boulevard / Rock Boulevard	AM	A	7.6	A	7.5	A	9.7
	PM	E	55.2	D	46.6	**B**	**18.1**
McCarran Boulevard / Pyramid Way	AM	E	64.5	F	93.0	**D**	**38.3**
	PM	F	116.8	F	132.6	E	65.1
McCarran Boulevard / 4th Street	AM	B	11.6	B	15.2	B	14.3
	PM	C	20.4	F	104.7	**C**	21.0
Pyramid Way / Queen Way	AM	D	37.1	F	182.4	**B**	**17.8**
	PM	C	26.4	D	48.5	**B**	**16.4**
Pyramid Way / Roberta Lane	AM	B	10.8	B	11.9	B	10.9
	PM	B	16.7	B	15.7	B	13.0
Pyramid Way / York Way	AM	A	5.6	A	5.7	A	7.4
	PM	B	13.7	B	14.9	B	14.0

*Significant improvements due to proposed Build alternative compared to the No-Build condition are shown in **bold**.*

Source: Project Traffic Study Report, Parsons, 2012.

The assumptions and modeling parameters used for local carbon monoxide hot spot analysis are based on the EPA's CO Guidelines (*Guideline for Modeling Carbon Monoxide from Roadway Intersections*, [EPA, 1992]). The modeling data/parameters used in CAL3QHC (based on Guidelines) are listed below.

Meteorology

- Mixing height: 1,000 meters
- Stability class: ” 3 “C”(atmosphere)
- Wind speed: 1 meter/second (minimum speed)
- Wind direction: worst case (all wind directions in 10-degree increments)
- Surface roughness: 175()
- Background CO: 1-hour and 8-hour concentrations of 1.5and 1.0ppm, respectively, based on *Washoe County Health District- Air Quality Trends (2002-2011)or Washoe County.*
- 8-hour Persistence factor: 0.7

Receptors

- Receptor height: 1.8 meter (5.9ft)
- Receptor Distance: 3 m (approximately 10 ft) from corner of intersection.

The modeled concentrations are presented in Table 5-2.

Table 5-2. Localized CO Concentrations at the Affected Intersection – Year 2030

Intersection	Peak Hour	1-hour Concentration (ppm)	8-hour Concentration (ppm)
		Build	Build
McCarran Boulevard / Pyramid Way	AM	5.0	3.45
	PM	4.5	3.1
National Standard (PPM)		35	9

Note: Total CO concentrations include background 1-hour and 8-hour concentrations of 1.5 and 1 ppm, respectively, based on Washoe County Health District- Air Quality Trends (2002-2011)or Washoe County.

[a] *The 8-hour CO concentrations were calculated using a 0.7 persistence factor in the following equation:* $CO_{(8\text{-}hr)} = CO_{(8\text{-}hr)}$, *(background) + 0.7*(1-hr project contribution from modeling)*

Source: NDOT, 2012.

Table 5-2 indicates that under the Build alternative, the worst case condition at the analyzed intersection the 1-hour CO concentration would be 5.0 and 4.5ppm and 8-hour CO concentration would be approximately 3.45 and 3.1ppm. These concentrations are below the 1-hour and 8-hour national standards of 35 ppm and 9 ppm, respectively; therefore the proposed project would not have a potential for CO hot-spot generation and would not cause any violation of the 1-hour and 8-hour CO NAAQS in future years.

Particulate Matter – PM_{10} Hot Spot Analysis

Sources of PM_{10} during operation of the project include vehicle exhaust, brake wear and tire wear, as well as re-entrained road dust. Pollutants emissions from vehicle exhaust typically are highest during vehicle idling. The proposed project Build Alternative would improve traffic flow and reduce congestion and idling time at the affected intersections. In addition, as summarized in Table 5-3, although under the Build Alternative the average daily volumes increase along the affected roadway segments, the average speeds increase and traffic flow would improve with Build Alternative, compared to No Build

scenario. As such, the proposed project would reduce exhaust emissions of PM as compared with the No Build scenario.

EPA and FHWA in their guidance document: *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* [EPA420-B-06-902, March 2006] issued a tiered approach to address the localized impacts of particulate matter. According to the guidelines, only a project that is considered a "Project of Air Quality Concern (POAQC)" is required to perform a quantitative analysis. The proposed project, as discussed below is not a POAQC.

Pursuant to Federal Conformity Regulations [specifically, 40 CFR 93.105 (c)(1)(i)] , an Interagency Review Form was prepared for the proposed project and was submitted to the transportation working group for interagency consultation (IAC).This group consists of representatives from the RTC, WC-AQMD, FHWA, NDOT, and EPA Region IX. The group conducted the IAC on September 14, 2012. A consensus determination was made that the project is not a POAQC.

Table 5-3. Roadway Segments Traffic Conditions – Horizon Year 2030

Roadway Segment	Traffic Direction	AADT – All Vehicles		% Change	Truck AADT		% Trucks Build and No Build	Peak Hour Speed (AM/PM)	
		No Build	Build		No Build	Build		No Build	Build
McCarran Blvd – Rock Blvd to Pyramid Way	EB	12,315	14,370	16.7	25	29	0.2	27/6	26/**20**
	WB	13,020	14,830	13.9	26	30	0.2	30/40	**39**/39
McCarran Blvd – Pyramid Way to 4th Street	EB	6,460	6,850	6.0	13	14	0.2	27/21	26/19
	WB	9,285	9,135	-1.6	19	18	0.2	12/13	12/14
Pyramid Way – North of Queen Way	NB	20,850	19,075	-8.5	42	38	0.2	34/34	**41/39**
	SB	20,740	21,010	1.3	41	42	0.2	16/15	**33/35**
Pyramid Way – Queen Way to McCarran Blvd	NB	15,615	18,105	15.9	31	36	0.2	26/16	**33/22**
	SB	16,775	20,420	21.7	34	41	0.2	4/25	**18**/22
Pyramid Way – McCarran Blvd to Roberta Lane	NB	8,040	8,515	5.9	193	204	2.4	12/8	**14/10**
	SB	11,545	12,655	9.6	277	304	2.4	26/27	**35/31**
Pyramid Way – Roberta Lane to York Way	NB	7,860	8,335	6.0	189	200	2.4	25/21	**30/26**
	SB	12,070	13,180	9.2	290	316	2.4	19/11	**27/14**

EB – eastbound; WB – westbound; NB – northbound; SB – southbound; Blvd - boulevard
*Significant improvement in peak hour average speeds due to the proposed project are shown in **bold**.*

Source: Project Traffic Study Report, Parsons, 2012

The proposed project is considered "not a POAQC" because it does not meet the definition of a POAQC as defined in the EPA Transportation Conformity Guidance. Projects of air quality concern are defined as:

i. New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

The proposed project is not a new or expanded highway project. The project is proposed to improve operations at an intersection of two arterial roadways with low volume (truck ADT between 13 and 316), and percentages of diesel vehicles (0.2% and 2.4%), as presented in Table 5-3. The proposed project would not affect the traffic mix (i.e. percentage of diesel trucks) at the intersection or along the affected roadways. Furthermore, the average annual daily traffic (AADT), along all segments of the affected roadways, are projected to be well below the threshold level of 150,000 vehicles per day in the horizon year 2030.

ii. Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

The proposed project Build Alternative is intended to enhance the operational characteristics of a congested intersection (projected to operate at LOS F), and to improve safety for motorists, bicyclists and pedestrians. The proposed Build Alternative would improve the LOS and/or delay per vehicle at all affected intersections (see Table 5-1).

iii. New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

The project does not include any new bus or rail terminals or transfer points.

iv. Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;

The project does not include any expanded bus or rail terminals or transfer points.

v. Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The project site is not identified in the SIP as a site of possible violation for PM_{10}. According to the 2030 RTIP, there are no sites of potential PM_{10} violation identified in the County.

Based on the above discussion, although the proposed project is located in a PM_{10} nonattainment area (HA 87), it would not be considered a project of air quality concerns. The project operation would not cause potential PM hot spot and thus, a qualitative or quantitative PM analysis in not required.

Furthermore, construction of project proposed improvements would last 18 months and would comply with WC-AQMD Rule 040.030; therefore, temporary construction emissions are not required to be considered in hot spot analysis.

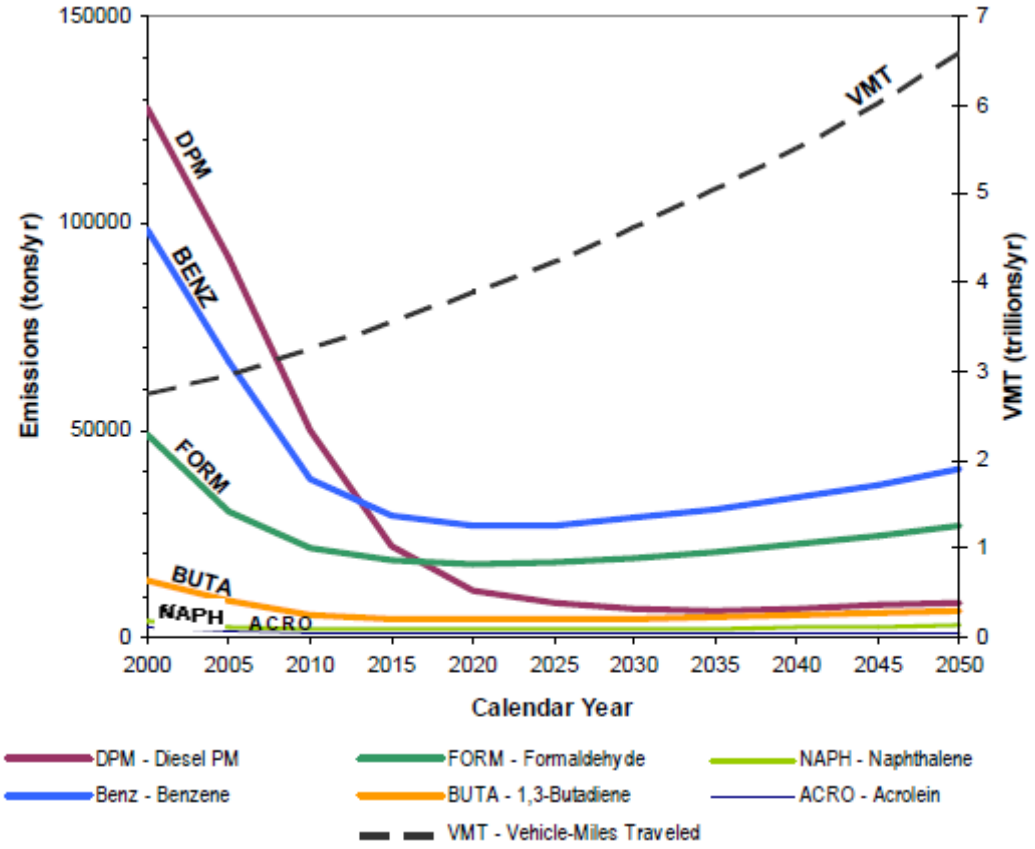
5.2.1.3 Mobile Source Air Toxics (MSAT)

As described in section 2.1.3 of this report, the FHWA Interim Guidance Update sets forth a tiered approach for addressing and evaluating potential impact of MSAT emissions for transportation projects.. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. Currently, the tools and techniques for assessing project-specific health impacts from MSATs are limited. Furthermore, EPA has not established regulatory concentration targets for the seven relevant MSAT pollutants appropriate for use in the project development process. For the same reason, states are neither required to achieve an identified level of air toxics in the ambient air nor identify air toxics reduction measures in the SIP.

The 2007 EPA rule mentioned in Section 2.1.3 requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 5-1.

The projected AADT at the intersection of Pyramid Way and McCarran Boulevard for 2030 build conditions is approximately 70,000. In addition, the proposed project is not anticipated to significantly affect traffic patterns or fleet mix in the project area (see Tables 5-1 and 5-2). Based on FHWA’s tiered approach, this project would be considered to have minimal potential MSAT effects and a qualitative analysis was conducted.

Figure 5-1 National MSAT Emissions Trend, 1999 - 2050 for Vehicles Operating on Roadways



Notes: (1) The projected data were estimated using EPA's MOBIL6.2 Model run 20 August 2009.

(2) Annual emissions of polycyclic organic mater are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.

(3) Trends for specific location may be different, depending on locally derived information representing vehicle-miles traveled, vehicle speeds, vehicle mix, fuels, emission control programs, methodology, and other factors

Source: FHWA, 2009

Incomplete or Unavailable Information for Project-Specific MSAT Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the

Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, https://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's *Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Web site, http://pubs.healtheffects.org/view.php?id=282) or in future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affect emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California ARB's Emfac2007 model, and the EPA's Draft MOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (DPM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in a study by the National Cooperative Highway Research Program (NCHRP), available at (www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country – three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel particulates (DPM). The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Summary of Existing Credible Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some are either statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the

NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

MSAT Analysis

For the preferred alternative in this EIS, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the preferred Build Alternative is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. Refer to Table 5-4. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6.2 model, emissions of all of the priority MSAT except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than 32 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Table 5-4 – Project Vehicle Miles Traveled

	VMT	Percent Change
No Build Alternative	15354075	12
Build Alternative	17305200	

Source: NDOT, 2012

5.2.1.4 Construction Impacts and Mitigation

CO Impacts and Mitigation

There will be short-term, localized increases in CO emissions during construction. This will be due to slowing of traffic in construction zones and also due to emissions from construction equipment. However, these CO increases would be temporary and would not cause long-term adverse effects. Contractors will be required to comply with federal, state, and local regulations for the control of air pollution, including those that prohibit unnecessary idling of diesel-powered trucks.

PM_{10} Impacts and Mitigation

Emissions of fugitive dust are anticipated during construction, but the resulting increases in PM_{10} would be temporary and would not cause long-term adverse effects. Contractors

will be required to comply with federal, state, and local regulations for the control of air pollution. All new roadway construction projects within the Truckee Meadows Basin are subject to regulations set forth by the WC-AQMD.

6.0 REFERENCES

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Appendix A
Addendum to the Air Quality Study

CM-0191(063)
73299
Pyramid McCarran Intersection Improvement Project
Environmental Impact Study Documentation
Addendum to the Air Quality Study
August 24, 2012

The intersection of Pyramid Way and McCarran Boulevard has the worst LOS for build 2030. Hence this intersection was chosen for the Intersection Modeling. Since we are modeling for the worst intersection, if the concentration of CO is lower than the NAAQS then it will be lower for all the other intersections

All the analyses were conducted using peak hour speeds from Table 5.4 Roadway Segments Traffic Conditions- Horizon Year 2030 in Parson's Air Quality Tech report. Peak hour volumes used were from the Parson's traffic report (April 2012) and signal cycle for the analysis was obtained from Parson's traffic personnel.

Summary Table for CO Model Results

Peak hour/Location	**Total CO 1-hour (PPM)**	**Total CO 8-hour (PPM)**
AM Peak/Pyramid McCarran	5	3.45
PM Peak/Pyramid McCarran	4.5	3.1

1-hour CO NAAQS = 35 PPM
8-hour CO NAAQS = 9 PPM
EPA recommended 8-hour persistence factor = 0.7

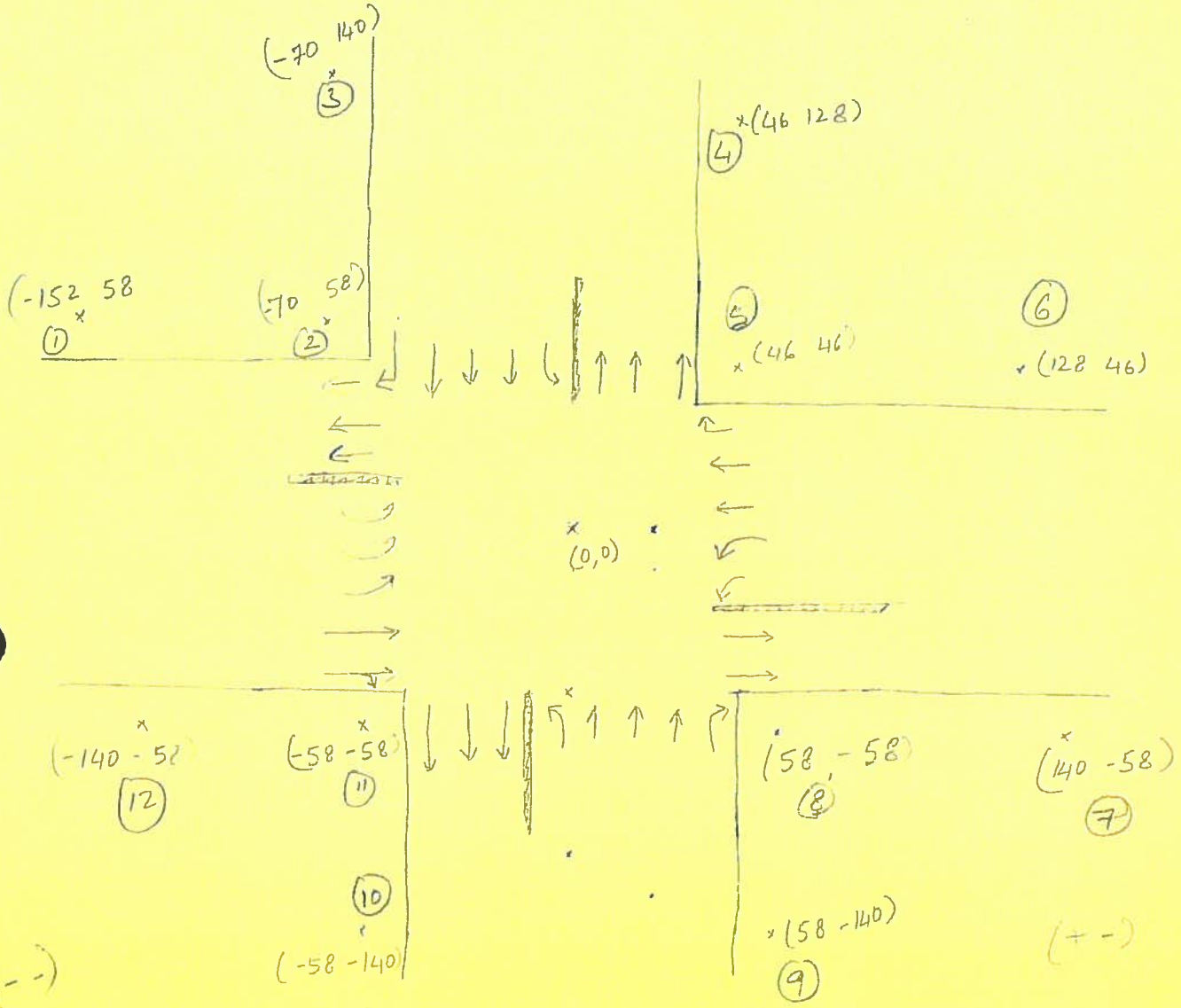
1-hour background CO = 1.5 PPM
8-hour background CO = 1 PPM
The background values are taken from *Washoe County Health District-AQMD Air Quality Trends (2002-2011)* for Washoe County.

Pyramid / McCarran 2030 Build.

N

(- +)

(+ +)



```
****************    Header Section    ****************
*Input file for Pyramid McCarran 2030 Build CO Hotspot Analysis
MOBILE6 INPUT FILE : PyMc2030B.in

POLLUTANTS         : CO
DATABASE VEHICLES  : 22222 22222222 2 222 22222222 222
DATABASE FACILITIES: LOCAL ARTERIAL
*                                    *
*        End Header:                 *
*********************************************
*
*
****************     Run Section      ****************
*
*********************************************************
*         Begin Run: 1
*
RUN DATA
*
MIN/MAX TEMP       : 21.8 45.5
FUEL RVP           : 12.96
OXYGENATED FUELS   : .001 .9999 .027 .035 1
NO REFUELING       :
EXPRESS HC AS VOC  :
IDLE PM EMISSIONS  :
*
*
*********************************************************
* Begin I/M Program: 1
*              MY: 1968-1980
*          Vehicles: Light and Heavy Duty Gasoline
*
I/M PROGRAM        : 1 1983 2050 1 TRC 2500/IDLE
I/M MODEL YEARS    : 1 1968 1980
I/M VEHICLES       : 1 22222 22222222 2
I/M STRINGENCY     : 1 26.0
I/M COMPLIANCE     : 1 98.0
I/M WAIVER RATES   : 1 0.7 0.0
I/M EFFECTIVENESS  : 0.50 0.50 0.50
I/M GRACE PERIOD   : 1 3
ANTI-TAMP PROG     : 81 68 80 22222 22222222 2 11 098. 11111112
*
*   End I/M Program: 1
*********************************************************
*
*
*********************************************************
* Begin I/M Program: 2
*               MY: 1981-1995
*          Vehicles: Light and Heavy Duty Gasoline
*
I/M PROGRAM        : 2 1983 2050 1 TRC 2500/IDLE
I/M MODEL YEARS    : 2 1981 1995
I/M VEHICLES       : 2 22222 22222222 2
I/M STRINGENCY     : 2 26.0
***                  (This command has no effect on this I/M program)
I/M COMPLIANCE     : 2 98.0
I/M WAIVER RATES   : 2 0.0 0.2
I/M EFFECTIVENESS  : 0.50 0.50 0.50
I/M GRACE PERIOD   : 2 3
ANTI-TAMP PROG     : 81 81 95 22222 22222222 2 11 098. 22212222
```

```
*
*   End I/M Program: 2
*****************************************************
*
*
*****************************************************
* Begin I/M Program: 3
*                MY: 1996-2050
*          Vehicles: Heavy Duty Gasoline
*
I/M PROGRAM         : 3 1983 2050 1 TRC 2500/IDLE
I/M MODEL YEARS     : 3 1996 2050
I/M VEHICLES        : 3 11111 22222222 2
I/M STRINGENCY      : 3 26.0
***                   (This command has no effect on this I/M program)
I/M COMPLIANCE      : 3 98.0
I/M WAIVER RATES    : 3 0.0 0.0
I/M EFFECTIVENESS   : 0.50 0.50 0.50
I/M GRACE PERIOD    : 3 3
ANTI-TAMP PROG      : 81 96 50 11111 22222222 2 11 098. 22212222
*
*   End I/M Program: 3
*****************************************************
*
*
*****************************************************
* Begin I/M Program: 4
*                MY: 1996-2050
*          Vehicles: Light Duty Gasoline
*
I/M PROGRAM         : 4 2002 2050 1 TRC OBD I/M
I/M MODEL YEARS     : 4 1996 2050
I/M VEHICLES        : 4 22222 11111111 1
I/M STRINGENCY      : 4 26.0
***                   (This command has no effect on this I/M program)
I/M COMPLIANCE      : 4 98.0
I/M WAIVER RATES    : 4 0.0 0.1
I/M EFFECTIVENESS   : 0.50 0.50 0.50
I/M GRACE PERIOD    : 4 3
*
*   End I/M Program: 4
*****************************************************
*
*
* I/M Stringency and Waiver Rates for all 4 I/M programs
* from "2008 State of Nevada, USEPA Annual Report".
*
*
****************   Scenario Section   ****************
SCENARIO RECORD     : Build: Jan 2030 (Truckee Meadows (HA 87) - Winter Idle)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
AVERAGE SPEED       : 2.5   ARTERIAL
GASOLINE SULFUR     : 8.3
DIESEL SULFUR       : 7.2
*
SCENARIO RECORD     : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
```

```
AVERAGE SPEED      : 10   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 12   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 14   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 18   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 19   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 20   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 22   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR      : 2030
EVALUATION MONTH   : 1
ALTITUDE           : 2
AVERAGE SPEED      : 26   ARTERIAL
GASOLINE SULFUR    : 8.3
DIESEL SULFUR      : 7.2
*
SCENARIO RECORD    : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
```

```
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
AVERAGE SPEED       : 31   ARTERIAL
GASOLINE SULFUR     : 8.3
DIESEL SULFUR       : 7.2
*
SCENARIO RECORD     : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
AVERAGE SPEED       : 33   ARTERIAL
GASOLINE SULFUR     : 8.3
DIESEL SULFUR       : 7.2
*
SCENARIO RECORD     : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
AVERAGE SPEED       : 35   ARTERIAL
GASOLINE SULFUR     : 8.3
DIESEL SULFUR       : 7.2
*
SCENARIO RECORD     : Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
CALENDAR YEAR       : 2030
EVALUATION MONTH    : 1
ALTITUDE            : 2
AVERAGE SPEED       : 39   ARTERIAL
GASOLINE SULFUR     : 8.3
DIESEL SULFUR       : 7.2
*
*
END OF RUN
```

```
*****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                                *
* Input file: PYMC1.IN (file 1, run 1).                                     *
*****************************************************************************
  M603 Comment:
               User has disabled the calculation of REFUELING emissions.


* # # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Winter Idle)
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =   8.3 ppm.


          User supplied gasoline sulfur content of   8.3 ppm requires an
           external file but none was provided.
          Sulfur content set to 30 ppm.

*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
  M 48 Warning:
               there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  Jan.
                          Altitude:  High
                Minimum Temperature:  21.8 (F)
                Maximum Temperature:  45.5 (F)
                  Absolute Humidity:   75. grains/lb
                   Nominal Fuel RVP:  13.0 psi
                      Weathered RVP:  13.0 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  No
                        ATP Program:  Yes
                   Reformulated Gas:  No

   Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
   Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                          Alcohol Blend RVP Waiver: No

       Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                 <6000      >6000     (All)
                       ------    ------     ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2790    0.4400     0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

Composite CO :	22.68	21.64	26.12	22.78	109.66	1.869	1.139	2.818	83.45	24.419

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =   8.3 ppm.


          User supplied gasoline sulfur content of   8.3 ppm requires an
           external file but none was provided.
          Sulfur content set to 30 ppm.

  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  Jan.
                       Altitude:  High
              Minimum Temperature:  21.8 (F)
              Maximum Temperature:  45.5 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.0 psi
                    Weathered RVP:  13.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  Yes
                 Evap I/M Program:  No
                      ATP Program:  Yes
                Reformulated Gas:  No

   Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
   Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                          Alcohol Blend RVP Waiver: No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000

Composite Emission Factors (g/mi):

Composite CO :	12.43	11.69	13.66	12.19	58.29	1.148	0.693	1.586	34.73	13.089

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # #
```

```
 M583 Warning:
           The user supplied arterial average speed of 12.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

         User supplied gasoline sulfur content =   8.3 ppm.


         User supplied gasoline sulfur content of   8.3 ppm requires an
          external file but none was provided.
         Sulfur content set to 30 ppm.

 M 48 Warning:
             there are no sales for vehicle class HDGV8b
 M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  Jan.
                        Altitude:  High
               Minimum Temperature:  21.8 (F)
               Maximum Temperature:  45.5 (F)
                 Absolute Humidity:   75. grains/lb
                  Nominal Fuel RVP:  13.0 psi
                      Weathered RVP:  13.0 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  Yes
                  Evap I/M Program:  No
                       ATP Program:  Yes
                  Reformulated Gas:  No

  Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
  Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                         Alcohol Blend RVP Waiver: No

      Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:                <6000      >6000     (All)
                       ------    ------     ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2790    0.4400     0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     11.93     11.18      13.03     11.65     49.63     1.019     0.613     1.365     31.58    12.283
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 14.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

         User supplied gasoline sulfur content =   8.3 ppm.
```

```
         User supplied gasoline sulfur content of   8.3 ppm requires an
          external file but none was provided.
         Sulfur content set to 30 ppm.

 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  Jan.
                       Altitude:  High
            Minimum Temperature:  21.8 (F)
            Maximum Temperature:  45.5 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.0 psi
                  Weathered RVP:  13.0 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  Yes
               Evap I/M Program:  No
                    ATP Program:  Yes
              Reformulated Gas:  No

  Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
  Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                         Alcohol Blend RVP Waiver: No

      Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC    All Veh
             GVWR:                <6000      >6000      (All)
                       ------    ------     ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2790    0.4400     0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     11.58     10.82      12.57     11.26     43.45     0.926     0.556     1.208     29.33    11.708
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =   8.3 ppm.


          User supplied gasoline sulfur content of   8.3 ppm requires an
           external file but none was provided.
          Sulfur content set to 30 ppm.

  M 48 Warning:
```

```
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  Jan.
                       Altitude:  High
            Minimum Temperature:  21.8 (F)
            Maximum Temperature:  45.5 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.0 psi
                  Weathered RVP:  13.0 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  Yes
               Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

  Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
  Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                         Alcohol Blend RVP Waiver: No

      Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:                 <6000      >6000     (All)
                     ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.2790    0.4400    0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :    11.11     10.33     11.97     10.75     33.95     0.780     0.466     0.958     26.39    10.893
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 19.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

         User supplied gasoline sulfur content =   8.3 ppm.


         User supplied gasoline sulfur content of   8.3 ppm requires an
          external file but none was provided.
         Sulfur content set to 30 ppm.

  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  Jan.
                      Altitude:  High
```

```
              Minimum Temperature:  21.8 (F)
              Maximum Temperature:  45.5 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.0 psi
                    Weathered RVP:  13.0 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  Yes
                 Evap I/M Program:  No
                      ATP Program:  Yes
                Reformulated Gas:  No

  Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
  Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                         Alcohol Blend RVP Waiver: No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	11.02	10.25	11.86	10.66	32.10	0.752	0.448	0.909	25.86	10.739

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =   8.3 ppm.


          User supplied gasoline sulfur content of   8.3 ppm requires an
           external file but none was provided.
          Sulfur content set to 30 ppm.

  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  Jan.
                      Altitude:  High
              Minimum Temperature:  21.8 (F)
              Maximum Temperature:  45.5 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.0 psi
                    Weathered RVP:  13.0 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  Yes
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

 Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
 Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                        Alcohol Blend RVP Waiver: No

     Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:                <6000      >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2790    0.4400    0.1500                0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     10.95     10.17     11.76     10.57     30.43     0.726     0.432     0.864     25.37    10.600
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 22.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

         User supplied gasoline sulfur content =   8.3 ppm.


         User supplied gasoline sulfur content of   8.3 ppm requires an
          external file but none was provided.
         Sulfur content set to 30 ppm.

  M 48 Warning:
           there are no sales for vehicle class HDGV8b
  M 48 Warning:
           there are no sales for vehicle class LDDT12

                Calendar Year:  2030
                        Month:  Jan.
                     Altitude:  High
           Minimum Temperature:  21.8 (F)
           Maximum Temperature:  45.5 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.0 psi
                 Weathered RVP:  13.0 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  Yes
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

 Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
 Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
```

Alcohol Blend RVP Waiver: No

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	10.82	10.04	11.60	10.43	27.45	0.677	0.402	0.782	24.27	10.363

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 26.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =   8.3 ppm.


          User supplied gasoline sulfur content of   8.3 ppm requires an
           external file but none was provided.
          Sulfur content set to 30 ppm.

  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  Jan.
                      Altitude:  High
             Minimum Temperature:  21.8 (F)
             Maximum Temperature:  45.5 (F)
               Absolute Humidity:   75. grains/lb
                  Nominal Fuel RVP:  13.0 psi
                     Weathered RVP:  13.0 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  Yes
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

   Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
   Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                          Alcohol Blend RVP Waiver: No
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000

Composite Emission Factors (g/mi):

Composite CO :	10.65	9.86	11.38	10.25	22.94	0.604	0.357	0.656	22.42	10.020

* #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 10.
* #

M583 Warning:
The user supplied arterial average speed of 31.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

User supplied gasoline sulfur content = 8.3 ppm.

User supplied gasoline sulfur content of 8.3 ppm requires an
external file but none was provided.
Sulfur content set to 30 ppm.

M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year:	2030
Month:	Jan.
Altitude:	High
Minimum Temperature:	21.8 (F)
Maximum Temperature:	45.5 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	13.0 psi
Weathered RVP:	13.0 psi
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	No
ATP Program:	Yes
Reformulated Gas:	No

Ether Blend Market Share: 0.001 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.027 Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000

Composite Emission Factors (g/mi):

Composite CO :	10.58	9.80	11.30	10.18	19.24	0.540	0.318	0.548	20.27	9.808

* #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 11.

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

           User supplied gasoline sulfur content =   8.3 ppm.


           User supplied gasoline sulfur content of   8.3 ppm requires an
            external file but none was provided.
           Sulfur content set to 30 ppm.

  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  Jan.
                         Altitude:  High
                Minimum Temperature:  21.8 (F)
                Maximum Temperature:  45.5 (F)
                  Absolute Humidity:   75. grains/lb
                   Nominal Fuel RVP:  13.0 psi
                      Weathered RVP:  13.0 psi
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  No
                        ATP Program:  Yes
                   Reformulated Gas:  No

   Ether Blend Market Share: 0.001       Alcohol Blend Market Share: 1.000
   Ether Blend Oxygen Content: 0.027     Alcohol Blend Oxygen Content: 0.035
                                          Alcohol Blend RVP Waiver: No

        Vehicle Type:      LDGV    LDGT12     LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                 <6000      >6000     (All)
                        ------    ------     ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2790    0.4400     0.1500              0.0363    0.0003    0.0022    0.0872    0.0050    1.0000
  -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     10.59      9.82      11.32     10.20     18.23     0.522     0.306     0.517     19.51     9.781
  -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
```

User supplied gasoline sulfur content = 8.3 ppm.

User supplied gasoline sulfur content of 8.3 ppm requires an external file but none was provided.
Sulfur content set to 30 ppm.

M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year:	2030
Month:	Jan.
Altitude:	High
Minimum Temperature:	21.8 (F)
Maximum Temperature:	45.5 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	13.0 psi
Weathered RVP:	13.0 psi
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	No
ATP Program:	Yes
Reformulated Gas:	No

Ether Blend Market Share: 0.001 Alcohol Blend Market Share: 1.000
Ether Blend Oxygen Content: 0.027 Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	10.61	9.84	11.34	10.22	17.34	0.506	0.296	0.489	18.84	9.757

* #
* Build: Jan 2030 (Truckee Meadows (HA 87) - Arterial)
* File 1, Run 1, Scenario 13.
* #
M583 Warning:
The user supplied arterial average speed of 39.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

User supplied gasoline sulfur content = 8.3 ppm.

User supplied gasoline sulfur content of 8.3 ppm requires an external file but none was provided.
Sulfur content set to 30 ppm.

M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year:	2030
Month:	Jan.
Altitude:	High
Minimum Temperature:	21.8 (F)
Maximum Temperature:	45.5 (F)
Absolute Humidity:	75. grains/lb
Nominal Fuel RVP:	13.0 psi
Weathered RVP:	13.0 psi
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	No
ATP Program:	Yes
Reformulated Gas:	No

Ether Blend Market Share: 0.001
Ether Blend Oxygen Content: 0.027
Alcohol Blend Market Share: 1.000
Alcohol Blend Oxygen Content: 0.035
Alcohol Blend RVP Waiver: No

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	10.85	10.10	11.66	10.50	16.28	0.484	0.283	0.451	17.89	9.942

```
'Pyramid McCarran Build AM' 60.00 175.00  0.00  0.00  12  0.3048  1  1
'Rcpt_1 ' -152.00   58.00    5.90
'Rcpt_2 '  -70.00   58.00    5.90
'Rcpt_3 '  -70.00  140.00    5.90
'Rcpt_4 '   46.00  128.00    5.90
'Rcpt_5 '   46.00   46.00    5.90
'Rcpt_6 '  128.00   46.00    5.90
'Rcpt_7 '  140.00  -58.00    5.90
'Rcpt_8 '   58.00  -58.00    5.90
'Rcpt_9 '   58.00 -140.00    5.90
'Rcpt_10'  -58.00 -140.00    5.90
'Rcpt_11'  -58.00  -58.00    5.90
'Rcpt_12' -140.00  -58.00    5.90
'Pyramid McCarran Build AM 2030'  16  1  0  'C'
    1
'EBA    ' 'AG' -1000.00  -36.00   0.00  -36.00   939.00  10.02  0.00  80.00
    1
'EBD    ' 'AG'    0.00   -36.00 1000.00 -36.00   532.00  10.02  0.00  44.00
    1
'WBA    ' 'AG' 1000.00   18.00    0.00   18.00   856.00  12.283 0.00  80.00
    1
'WBD    ' 'AG'    0.00   18.00 -1000.00  18.00  1811.00   9.942 0.00  56.00
    1
'NBA    ' 'AG'   24.00 -1000.00   24.00   0.00   492.00  11.708 0.00  80.00
    1
'NBD    ' 'AG'   24.00    0.00    24.00  1000.0  949.00   9.781 0.00  56.00
    1
'SBA    ' 'AG'  -36.00 1000.00  -36.00    0.00  2809.00  10.893 0.00  80.00
    1
'SBD    ' 'AG'  -36.00    0.00  -36.00 -1000.00 1804.00   9.757 0.00  56.00
    2
'EBL    ' 'AG'  -48.00   -6.00 -148.00   -6.00  0.00 36.00    3
      120   91.0  4.30   499  61.04  1600    2     3
    2
'EBT    ' 'AG'  -48.00  -36.00 -148.00  -36.00  0.00 24.00    2
      120   82.0  3.5    440   61.04  1600    2     3
    2
'WBL    ' 'AG'   36.00  -12.00  136.00  -12.00  0.00 24.00    2
      120  101    4.00  141   61.04  1600    2     3
    2
'WBT    ' 'AG'   36.00   18.00  136.00   18.00  0.00 36.00    3
      120  89.0  4.30   715   61.04  1600    2     3
    2
'NBL    ' 'AG'   -6.00  -48.00  -6.00  -148.00  0.00 12.00    1
      120  102.0  3.00   85   61.04  1600    2     3
    2
'NBT    ' 'AG'   24.00  -48.00   24.00 -148.00  0.00 48.00    4
      120   75.0   3.60  407  61.04  1600    2     3
    2
'SBL    ' 'AG'   -6.00   36.00   -6.00  136.00  0.00 12.00    1
      120  105.0   3.00  144  61.04  1600    2     3
    2
'SBT    ' 'AG'  -36.00   36.00  -36.00  136.00  0.00 48.00    4
      120  75     3.60  2665  61.04  1600    2     3
1 0 3 1000 0 'y' 10 0 36
```

JOB: Pyramid McCarran Build AM RUN: Pyramid McCarran Build AM 2030

DATE : 8/27/12
TIME : 12:29:26

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 3 (C) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
1. EBA	-1000.0	-36.0	0.0	-36.0	1000.	90.	AG	939.	10.0	0.0	80.0		
2. EBD	0.0	-36.0	1000.0	-36.0	1000.	90.	AG	532.	10.0	0.0	44.0		
3. WBA	1000.0	18.0	0.0	18.0	1000.	270.	AG	856.	12.3	0.0	80.0		
4. WBD	0.0	18.0	-1000.0	18.0	1000.	270.	AG	1811.	9.9	0.0	56.0		
5. NBA	24.0	-1000.0	24.0	0.0	1000.	360.	AG	492.	11.7	0.0	80.0		
6. NBD	24.0	0.0	24.0	1000.0	1000.	360.	AG	949.	9.8	0.0	56.0		
7. SBA	-36.0	1000.0	-36.0	0.0	1000.	180.	AG	2809.	10.9	0.0	80.0		
8. SBD	-36.0	0.0	-36.0	-1000.0	1000.	180.	AG	1804.	9.8	0.0	56.0		
9. EBL	-48.0	-6.0	-130.6	-6.0	83.	270.	AG	372.	100.0	0.0	36.0	0.55	4.2
10. EBT	-48.0	-36.0	-146.6	-36.0	99.	270.	AG	224.	100.0	0.0	24.0	0.51	5.0
11. WBL	36.0	-12.0	74.7	-12.0	39.	90.	AG	276.	100.0	0.0	24.0	0.40	2.0
12. WBT	36.0	18.0	151.8	18.0	116.	90.	AG	364.	100.0	0.0	36.0	0.72	5.9
13. NBL	-6.0	-48.0	-6.0	-95.4	47.	180.	AG	139.	100.0	0.0	12.0	0.49	2.4
14. NBT	24.0	-48.0	24.0	-89.4	41.	180.	AG	409.	100.0	0.0	48.0	0.19	2.1
15. SBL	-6.0	36.0	-6.0	272.5	237.	360.	AG	143.	100.0	0.0	12.0	1.08	12.0
16. SBT	-36.0	36.0	-36.0	1796.6	1761.	360.	AG	409.	100.0	0.0	48.0	1.27	89.4

JOB: Pyramid McCarran Build AM RUN: Pyramid McCarran Build AM 2030

DATE : 8/27/12
TIME : 12:29:26

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
9. EBL	120	91	4.3	499	1600	61.04	2	3
10. EBT	120	82	3.5	440	1600	61.04	2	3
11. WBL	120	101	4.0	141	1600	61.04	2	3
12. WBT	120	89	4.3	715	1600	61.04	2	3
13. NBL	120	102	3.0	85	1600	61.04	2	3
14. NBT	120	75	3.6	407	1600	61.04	2	3
15. SBL	120	105	3.0	144	1600	61.04	2	3
16. SBT	120	75	3.6	2665	1600	61.04	2	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z

1.	Rcpt_1	*	-152.0	58.0	5.9 *
2.	Rcpt_2	*	-70.0	58.0	5.9 *
3.	Rcpt_3	*	-70.0	140.0	5.9 *
4.	Rcpt_4	*	46.0	128.0	5.9 *
5.	Rcpt_5	*	46.0	46.0	5.9 *
6.	Rcpt_6	*	128.0	46.0	5.9 *
7.	Rcpt_7	*	140.0	-58.0	5.9 *
8.	Rcpt_8	*	58.0	-58.0	5.9 *
9.	Rcpt_9	*	58.0	-140.0	5.9 *
10.	Rcpt_10	*	-58.0	-140.0	5.9 *
11.	Rcpt_11	*	-58.0	-58.0	5.9 *
12.	Rcpt_12	*	-140.0	-58.0	5.9 *

JOB: Pyramid McCarran Build AM

RUN: Pyramid McCarran Build AM 2030

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	*	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12
0.	*	0.5	2.4	2.3	1.2	1.4	0.4	1.1	2.2	1.5	1.9	3.5	1.8
10.	*	0.8	2.7	2.6	0.8	0.8	0.2	0.9	1.7	1.2	2.1	3.3	2.3
20.	*	1.0	2.7	2.7	0.4	0.4	0.0	0.6	1.4	0.9	2.1	2.9	2.5
30.	*	1.0	2.6	2.7	0.1	0.2	0.1	0.5	1.0	0.4	1.8	2.7	2.7
40.	*	1.2	2.5	2.5	0.1	0.2	0.1	0.5	0.9	0.3	1.6	2.1	2.7
50.	*	1.1	2.3	2.3	0.1	0.2	0.1	0.4	0.8	0.3	1.3	1.9	2.6
60.	*	1.1	2.2	2.2	0.0	0.3	0.1	0.4	0.6	0.2	1.2	2.0	2.3
70.	*	1.2	2.4	2.2	0.0	0.4	0.2	0.4	0.5	0.2	1.0	1.9	2.0
80.	*	1.4	2.5	2.3	0.0	0.6	0.3	0.4	0.5	0.2	0.9	1.7	1.7
90.	*	1.5	2.7	2.3	0.1	1.0	0.5	0.3	0.3	0.1	0.7	1.6	1.3
100.	*	1.4	2.7	2.4	0.1	1.2	0.7	0.3	0.3	0.0	0.6	1.5	1.0
110.	*	1.5	2.7	2.3	0.2	1.4	0.8	0.1	0.1	0.0	0.7	1.2	0.7
120.	*	1.7	2.5	2.4	0.3	1.5	0.9	0.1	0.1	0.0	0.7	1.1	0.5
130.	*	1.5	2.7	2.4	0.5	1.6	1.0	0.0	0.0	0.0	0.7	1.0	0.4
140.	*	1.5	2.3	2.6	0.5	1.6	1.0	0.0	0.0	0.0	0.8	1.1	0.5
150.	*	1.4	2.3	2.8	0.6	1.8	1.1	0.0	0.1	0.1	0.8	0.9	0.5
160.	*	1.5	2.2	2.7	0.6	1.8	1.2	0.0	0.1	0.1	0.9	0.9	0.4
170.	*	1.2	2.4	2.4	1.0	1.9	1.3	0.0	0.3	0.3	0.9	0.9	0.3
180.	*	1.0	2.3	2.2	1.2	2.0	1.6	0.1	0.5	0.3	0.8	0.9	0.2
190.	*	1.0	2.1	1.6	1.4	2.0	1.6	0.2	0.7	0.4	0.6	0.7	0.2
200.	*	0.7	1.9	1.3	1.6	1.9	1.9	0.2	0.9	0.4	0.4	0.5	0.1
210.	*	0.7	1.6	0.8	1.7	1.8	1.9	0.3	1.0	0.5	0.3	0.4	0.1
220.	*	0.7	1.3	0.7	1.7	1.9	1.9	0.3	1.1	0.5	0.2	0.3	0.1
230.	*	0.7	1.2	0.4	1.9	1.8	2.0	0.4	1.3	0.5	0.1	0.2	0.1
240.	*	0.8	1.1	0.4	1.9	1.9	2.0	0.4	1.4	0.5	0.1	0.3	0.2
250.	*	0.8	0.9	0.4	2.0	2.3	2.2	0.6	1.7	0.4	0.0	0.4	0.3
260.	*	0.6	0.6	0.3	1.9	2.2	2.0	0.8	2.0	0.5	0.0	0.6	0.4
270.	*	0.5	0.5	0.1	1.8	2.1	1.8	1.3	2.0	0.7	0.2	1.0	0.6
280.	*	0.4	0.4	0.1	1.8	2.1	1.7	1.5	2.2	0.7	0.2	1.2	0.7
290.	*	0.2	0.3	0.1	1.7	1.8	1.3	1.5	2.1	1.0	0.3	1.4	0.7
300.	*	0.1	0.2	0.1	1.7	1.9	1.2	1.5	2.0	1.1	0.5	1.8	0.8
310.	*	0.0	0.1	0.1	1.7	1.8	1.0	1.6	1.9	1.3	0.7	1.8	0.7

320.	*	0.0	0.3	0.3	1.9	1.9	1.0	1.8	2.3	1.6	0.6	2.0	0.7
330.	*	0.0	0.5	0.5	1.8	1.9	1.0	1.8	2.0	1.6	1.0	2.4	0.8
340.	*	0.1	1.1	1.0	1.8	1.8	0.8	1.6	2.5	1.9	1.3	2.8	1.2
350.	*	0.3	1.6	1.6	1.6	1.6	0.6	1.4	2.3	1.6	1.8	3.2	1.5
360.	*	0.5	2.4	2.3	1.2	1.4	0.4	1.1	2.2	1.5	1.9	3.5	1.8

THE HIGHEST CONCENTRATION OF 3.50 PPM OCCURRED AT RECEPTOR REC11.

```
'Pyramid McCarran Build PM' 60.00 175.00  0.00  0.00  12  0.3048  1  1
'Rcpt_1 ' -152.00   58.00    5.90
'Rcpt_2 '  -70.00   58.00    5.90
'Rcpt_3 '  -70.00  140.00    5.90
'Rcpt_4 '   46.00  128.00    5.90
'Rcpt_5 '   46.00   46.00    5.90
'Rcpt_6 '  128.00   46.00    5.90
'Rcpt_7 '  140.00  -58.00    5.90
'Rcpt_8 '   58.00  -58.00    5.90
'Rcpt_9 '   58.00 -140.00    5.90
'Rcpt_10'  -58.00 -140.00    5.90
'Rcpt_11'  -58.00  -58.00    5.90
'Rcpt_12' -140.00  -58.00    5.90
'Pyramid McCarran Build PM 2030'  16  1  0  'c'
    1
'EBA    ' 'AG' -1000.00  -36.00   0.00  -36.00  1985.00  10.60  0.00  80.00
    1
'EBD    ' 'AG'    0.00   -36.00 1000.00 -36.00   838.00  10.739 0.00  44.00
    1
'WBA    ' 'AG' 1000.00   18.00    0.00   18.00   971.00  11.708 0.00  80.00
    1
'WBD    ' 'AG'    0.00   18.00 -1000.00  18.00  1154.00  9.942  0.00  56.00
    1
'NBA    ' 'AG'   24.00 -1000.00   24.00   0.00  1210.00 13.089  0.00  80.00
    1
'NBD    ' 'AG'   24.00    0.00    24.00  1000.0 2722.00 10.363  0.00  56.00
    1
'SBA    ' 'AG'  -36.00 1000.00  -36.00    0.00  1275.00 10.363  0.00  80.00
    1
'SBD    ' 'AG'  -36.00    0.00  -36.00 -1000.00  727.00  9.808  0.00  56.00
    2
'EBL    ' 'AG'  -48.00   -6.00 -148.00   -6.00  0.00 36.00    3
      180  120    4.00  1257  61.04  1600    2    3
    2
'EBT    ' 'AG'  -48.00  -36.00 -148.00  -36.00  0.00 24.00    2
      180  142.2  4.3   728   61.04  1600    2    3
    2
'WBL    ' 'AG'   36.00  -12.00  136.00  -12.00  0.00 24.00    2
      180  132    4.00  103   61.04  1600    2    3
    2
'WBT    ' 'AG'   36.00   18.00  136.00   18.00  0.00 36.00    3
      180  142.2  4.30  868   61.04  1600    2    3
    2
'NBL    ' 'AG'   -6.00  -48.00  -6.00  -148.00  0.00 12.00    1
      180  141.8  3.00  108   61.04  1600    2    3
    2
'NBT    ' 'AG'   24.00  -48.00   24.00 -148.00  0.00 48.00    4
      180   124   3.60  1102  61.04  1600    2    3
    2
'SBL    ' 'AG'   -6.00   36.00   -6.00  136.00  0.00 12.00    1
      180   154   3.00  156   61.04  1600    2    3
    2
'SBT    ' 'AG'  -36.00   36.00  -36.00  136.00  0.00 48.00    4
      180   124   3.60 1119   61.04    1600    2    3
1 0 3 1000 0 'y' 10 0 36
```

JOB: Pyramid McCarran Build PM RUN: Pyramid McCarran Build PM 2030

DATE : 8/23/12
TIME : 11: 1:15

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 175. CM
U = 1.0 M/S CLAS = 3 (C) ATIM = 60. MINUTES MIXH = 1000. M AMB = 0.0 PPM BRG = 0. DEGREES

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	LENGTH (FT)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)	V/C	QUEUE (VEH)
1. EBA	-1000.0	-36.0	0.0	-36.0	1000.	90.	AG	1985.	10.6	0.0	80.0		
2. EBD	0.0	-36.0	1000.0	-36.0	1000.	90.	AG	838.	10.7	0.0	44.0		
3. WBA	1000.0	18.0	0.0	18.0	1000.	270.	AG	971.	11.7	0.0	80.0		
4. WBD	0.0	18.0	-1000.0	18.0	1000.	270.	AG	1154.	9.9	0.0	56.0		
5. NBA	24.0	-1000.0	24.0	0.0	1000.	360.	AG	1210.	13.1	0.0	80.0		
6. NBD	24.0	0.0	24.0	1000.0	1000.	360.	AG	2722.	10.4	0.0	56.0		
7. SBA	-36.0	1000.0	-36.0	0.0	1000.	180.	AG	1275.	10.4	0.0	80.0		
8. SBD	-36.0	0.0	-36.0	-1000.0	1000.	180.	AG	727.	9.8	0.0	56.0		
9. EBL	-48.0	-6.0	-322.9	-6.0	275.	270.	AG	327.	100.0	0.0	36.0	0.87	14.0
10. EBT	-48.0	-36.0	-1215.7	-36.0	1168.	270.	AG	258.	100.0	0.0	24.0	1.30	59.3
11. WBL	36.0	-12.0	72.8	-12.0	37.	90.	AG	240.	100.0	0.0	24.0	0.14	1.9
12. WBT	36.0	18.0	393.2	18.1	357.	90.	AG	387.	100.0	0.0	36.0	1.03	18.1
13. NBL	-6.0	-48.0	-6.0	-131.3	83.	180.	AG	128.	100.0	0.0	12.0	0.36	4.2
14. NBT	24.0	-48.0	24.0	-234.5	186.	180.	AG	451.	100.0	0.0	48.0	0.61	9.5
15. SBL	-6.0	36.0	-6.0	172.8	137.	360.	AG	140.	100.0	0.0	12.0	0.84	7.0
16. SBT	-36.0	36.0	-36.0	225.2	189.	360.	AG	451.	100.0	0.0	48.0	0.62	9.6

JOB: Pyramid McCarran Build PM RUN: Pyramid McCarran Build PM 2030

DATE : 8/23/12
TIME : 11: 1:15

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
9. EBL	180	120	4.0	1257	1600	61.04	2	3
10. EBT	180	142	4.3	728	1600	61.04	2	3
11. WBL	180	132	4.0	103	1600	61.04	2	3
12. WBT	180	142	4.3	868	1600	61.04	2	3
13. NBL	180	141	3.0	108	1600	61.04	2	3
14. NBT	180	124	3.6	1102	1600	61.04	2	3
15. SBL	180	154	3.0	156	1600	61.04	2	3
16. SBT	180	124	3.6	1119	1600	61.04	2	3

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	-152.0	58.0	5.9
2. Rcpt_2	-70.0	58.0	5.9
3. Rcpt_3	-70.0	140.0	5.9
4. Rcpt_4	46.0	128.0	5.9
5. Rcpt_5	46.0	46.0	5.9
6. Rcpt_6	128.0	46.0	5.9
7. Rcpt_7	140.0	-58.0	5.9
8. Rcpt_8	58.0	-58.0	5.9
9. Rcpt_9	58.0	-140.0	5.9
10. Rcpt_10	-58.0	-140.0	5.9
11. Rcpt_11	-58.0	-58.0	5.9
12. Rcpt_12	-140.0	-58.0	5.9

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8	REC9	REC10	REC11	REC12
0.	0.2	1.5	1.2	1.3	1.5	0.3	1.4	2.2	2.0	1.5	3.0	2.4
10.	0.4	1.8	1.6	1.0	1.1	0.1	1.2	2.0	1.7	1.8	2.9	2.7
20.	0.6	2.2	1.8	0.7	0.7	0.0	1.1	1.6	1.1	1.9	2.9	2.8
30.	0.8	2.3	1.9	0.4	0.5	0.1	1.1	1.4	0.8	1.9	2.6	2.9
40.	0.9	2.2	1.9	0.3	0.4	0.1	1.1	1.3	0.7	1.7	2.1	2.9
50.	0.9	2.2	2.0	0.2	0.4	0.2	1.0	1.2	0.6	1.6	2.3	2.7
60.	1.1	2.2	2.1	0.1	0.5	0.4	1.1	1.1	0.5	1.6	2.1	2.8
70.	1.3	2.3	2.1	0.1	0.8	0.5	1.0	1.1	0.4	1.6	2.3	2.7
80.	1.3	2.7	2.2	0.1	1.0	1.0	0.9	0.9	0.3	1.6	2.2	2.4
90.	1.6	2.7	2.3	0.2	1.4	1.3	0.7	0.7	0.2	1.6	2.0	2.0
100.	1.6	2.7	2.5	0.4	1.7	1.7	0.5	0.5	0.0	1.2	1.8	1.6
110.	1.7	2.7	2.6	0.7	1.8	1.7	0.2	0.2	0.0	1.1	1.7	1.3
120.	1.8	2.3	2.6	0.8	1.8	1.7	0.1	0.2	0.1	1.1	1.5	1.0
130.	1.8	2.3	2.6	0.9	1.9	1.7	0.1	0.2	0.1	1.0	1.4	0.8
140.	1.7	2.4	2.6	0.9	2.0	1.5	0.0	0.2	0.2	1.0	1.5	0.7
150.	1.8	2.1	2.5	1.2	2.0	1.5	0.0	0.3	0.3	0.9	1.3	0.5
160.	1.6	2.2	2.5	1.4	2.3	1.5	0.0	0.6	0.5	0.8	1.1	0.4
170.	1.7	2.0	2.1	1.7	2.5	1.7	0.1	0.9	0.7	0.7	0.9	0.3
180.	1.5	2.0	1.8	1.8	2.9	1.7	0.1	1.5	1.3	0.5	0.7	0.3
190.	1.4	1.8	1.5	2.0	2.9	1.9	0.3	1.8	1.5	0.3	0.4	0.1
200.	1.4	1.6	1.2	2.5	2.7	2.1	0.5	1.9	1.7	0.3	0.4	0.1
210.	1.4	1.5	1.0	2.5	2.8	2.2	0.6	2.0	1.8	0.1	0.3	0.1
220.	1.4	1.5	1.0	2.5	2.5	2.4	0.7	2.0	1.8	0.1	0.3	0.2
230.	1.5	1.5	0.8	2.4	2.6	2.4	0.8	2.0	1.8	0.0	0.2	0.2

240.	*	1.5	1.6	0.7	2.6	2.6	2.7	1.0	2.3	1.8	0.0	0.5	0.5
250.	*	1.3	1.4	0.6	2.6	2.8	2.6	1.1	2.5	1.7	0.0	0.9	0.8
260.	*	1.0	1.1	0.4	2.5	2.9	2.6	1.5	2.7	2.0	0.2	1.5	1.4
270.	*	0.8	0.9	0.3	2.4	2.8	2.1	1.8	2.9	2.5	0.4	2.0	1.9
280.	*	0.5	0.5	0.0	2.0	2.6	1.8	2.0	2.9	2.5	0.7	2.3	2.2
290.	*	0.2	0.2	0.0	1.8	2.3	1.7	1.7	2.7	2.6	0.8	2.5	2.5
300.	*	0.1	0.1	0.0	1.8	2.1	1.1	2.0	2.6	2.6	0.9	2.5	2.4
310.	*	0.0	0.1	0.1	1.7	2.1	1.0	1.9	2.3	2.9	1.0	2.3	2.3
320.	*	0.0	0.2	0.1	1.9	2.1	0.8	1.6	2.3	2.8	1.1	2.2	2.2
330.	*	0.0	0.2	0.2	1.8	2.1	0.7	1.6	2.4	3.0	1.1	2.4	2.1
340.	*	0.0	0.6	0.5	1.6	2.0	0.6	1.5	2.4	2.5	1.3	2.6	2.1
350.	*	0.1	1.0	0.8	1.5	1.7	0.4	1.5	2.4	2.4	1.5	2.7	2.4
360.	*	0.2	1.5	1.2	1.3	1.5	0.3	1.4	2.2	2.0	1.5	3.0	2.4

THE HIGHEST CONCENTRATION OF 3.00 PPM OCCURRED AT RECEPTOR REC11.

Appendix B
RTC's Regional Transportation Plans

US 395/I-580/I-80	System wide ramps and freeways	Freeway Mgmt ITS Project	$30,000,000
ESTIMATED COST FREEWAY SYSTEM PLAN 2016-2018			**$1,743,552,000**

ADDITIONAL FREEWAY SYSTEM CONGESTED SEGMENTS/NEW FREEWAYS 2019-2030			
Segment	**Limits**	**Nominal Improvement**	**Estimated Cost**
I-80	Garson Road to West 4th Street	Widen to 6 lanes	$79,749,000
I-80	@ Garson Road	Improve Interchange	$34,567,000
I-80	Robb Drive to West McCarran Blvd	Widen to 6 lanes	$20,287,000
I-80	Keystone Avenue to Virginia Street	Widen to 8 lanes	$22,287,000
I-80	Rock Blvd to Sparks Blvd	Widen to 8 lanes	$103,953,000
I-80	Lockwood to East Truckee Canyon/Spanish Springs Connector	Widen to 10 lanes*	$124,947,000
I-80	@ Tracy Clark	Construct Interchange	$34,567,000
US 395	Stead Blvd to Cold Springs	Widen to 6 lanes	$175,062,000
US 395	Golden Valley Road to Lemmon Drive	Widen to 8 lanes	$29,396,000
US 395	Damonte Ranch Parkway to S Meadows Parkway	Widen to 10 lanes	$37,639,000
East Truckee Canyon/Spanish Springs Connector	I-80 to US 395/Pyramid Freeway	New 6 lane freeway	$624,938,000
US 395/I-580/I-80	System wide ramps and freeways	Freeway Mgmt ITS Project	$18,000,000
ESTIMATED COST FREEWAY SYSTEM PLAN 2019-2030			**$1,305,392,000**

*Note: A 10 lane segment is considered the maximum feasible improvement for the freeway system. The following segments will still not meet policy LOS at 10 lanes and will need to be addressed in a future RTP.

I-80 US 395 to Rock Blvd
I-80 East McCarran Blvd to the East Truckee Canyon/Spanish Springs Connector
US 395 North McCarran Blvd to South Virginia/Kietzke
US 395 Neil Road to South Meadows Parkway

REGIONAL ROAD SYSTEM CONGESTED SEGMENTS/NEW ROADS 2008-2015			
Segment	**Limits**	**Nominal Improvement**	**Estimated cost**
Lemmon Drive	Memorial Drive to US 395	New 2 lane road	$3,364,000
McCarran Blvd	Greg Street to Longley Lane	Widen 4 to 6 lanes	$36,391,000
McCarran Blvd	I-80 to 7th Street	Widen 4 to 6 lanes	$14,817,000
Moana Lane	S Virginia Street to US 395	Widen 4 to 6 lanes	$15,862,000
Pyramid Highway	@McCarran Blvd	Intersection Improvements	$71,000,000
Vista Blvd	Los Altos Parkway (north) to Wingfield Parkway	Widen 2 to 4 lanes	$6,976,000
ESTIMATED COST REGIONAL ROAD SYSTEM PLAN 2008-2013			**$148,410,000**

REGIONAL ROAD SYSTEM CONGESTED SEGMENTS/NEW ROADS 2016-2018			
Segment	**Limits**	**Nominal Improvement**	**Estimated cost**
4th Street	I-80 to Mayberry Drive	Widen 2 to 4 lanes	$382,000
4th Street	Washington Street to Arlington Avenue	Widen 4 to 6 lanes	$8,254,000
4th Street	Virginia Street to Center Street	Widen 4 to 6 lanes	$6,296,000

FUND SOURCE: CONGESTION MITIGATION/AIR QUALITY (Page 1 of 2) FEDERAL-NON CAPACITY, AIR QUALITY BENEFIT PROJECTS-PRIORITIZED BY RTC

PROJECT DESCRIPTION	LIMITS	PHASE	PROJECT COSTS (000's) FY 09	FY 10	FY 11	FY 12	FY 13	PROJECT CONTRIBUTIONS ($000's) TOTAL	FEDERAL	STATE	LOCAL
Trip Reduction Program					$100	$100	$100	$300	$285	$0	$15 [1]
RIDE Replacement Vehicles[2]		V									
Number											
ACCESS Replacement Vehicles[2]		V			$670		$2,000	$2,670	$2,537	$0	$134
Number					*4*		*14*				
Traffic Management Program	Region-wide	E,R,C			$660	$2,260	$1,460	$4,380	$4,161	$0	$219 [3]
Geometric Improvements											
Pyramid Highway Urban Interchange	@ McCarran Blvd	E,R,C			$800	$300	$2,500	$3,600	$3,420	$180	$0
Other											
Demonstration Service S Virginia St RTC RAPID	$4.8 million RTC RAPID Operating FY11 RAPID capital $1.5 million FY11	C			$6,300			$6,300	$5,985	$0	$315
								See Totals On Page 6			

[1] Local contributions for transit projects are from a 1/4 cent sales tax revenue

[2] To be transferred to Section 5307

[3] Local contribution is from Regional Road Impact Fee funding

Approval Date 11/21/08

Amendment Date 11/1/10

Phases: E(Engineering/Design); R(Right-of-Way); C(Construction); V(Vehicles/Equipment);PD&E (Project Development and Environmental)

Totals may vary slightly due to rounding